Du'Bois J. Ferguson
Remediation Manager

Schlumberger Oilfield Service
300 Schlumberger Drive
Sugar Land, TX 77478
Tel: 281-285-3692
DFerguson3@slb.com

April 8, 2011

VIA FedEx Overnight

Section Chief
Environmental Enforcement Section
U.S. Department of Justice
PO Box 7611
Washington, DC 20044-7611

Craig Zeller
Remedial Project Manager
Superfund Division
U.S. EPA Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

Re: DOJ Case No. 90-11-2-696/1

Subject: March 2011 Monthly Report
Sangamo Weston/Twelvemile Creek/Lake Hartwell Superfund Site
Natural Resources Trustees Consent Decree

Dear Section Chief:

In accordance with the Consent Decree and Section XIV of the Unilateral Administrative Order for the above referenced site, Schlumberger is required to submit Progress Reports on a quarterly basis. Given the current pace of activities, we will be submitting Progress Reports on a monthly basis until further notice in satisfaction of the reporting requirements of the Consent Decree and Unilateral Administrative Order.

In keeping with Paragraph 20 of the Consent Decree:

> I certify that the information contained in or accompanying this submission is true, accurate and complete. This certification is based on my personal preparation, review, or analysis of the submission, and/or supervision of persons who, acting on my instructions, made the verification that the submitted information is true, accurate and complete.

If you have any questions, please do not hesitate to contact me at (281) 285-3692.

Sincerely,

D. J. Ferguson

DuBois J. Ferguson
Remediation Manager

U.S. EPA REGION IV

SDMS

POOR LEGIBILITY

PORTIONS OF THIS DOCUMENT MAY BE DIFFICULT TO VIEW DUE TO THE QUALITY OF THE ORIGINAL.

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V. 2-040506

cc: Honorable G. Ross Anderson, Jr.
G. Ross Anderson, Jr. Federal Building
and United States Courthouse
315 South McDuffie Street, 2nd Floor
Anderson, SC 29624

Honorable William W. Wilkins
Nexsen Pruet
55 E. Camperdown Way
Suite 400
Greenville SC 29601

Leon C. Harmon Esq.
Nexsen Pruet
55 E. Camperdown Way
Suite 400
Greenville SC 29601

John Cresswell
Assistant Director
Division of Site Assessment and Remediation
Bureau of Land &Waste Management
SC Department of Health and
Environmental Control
2600 Bull Street
Columbia, SC 29201

Regional Solicitor's Office
U.S. Department of the Interior
Attn: Harriet M. Deal
75 Spring Street, SW Room 304
Atlanta, GA 30303

Diane Beeman & Diane Duncan
Ecological Services Office
U.S. Fish and Wildlife Service
176 Croghan Spur Road, Suite 200
Charleston, SC 29407

Paul League
SC Department of Natural Resources
Office of Chief Counsel
1000 Assembly Street
Columbia, SC 29202

Anthony Rabern
Georgia Department of Natural Resources
3695 Highway 197
Clarkesville, GA 30523

Office of the Attorney General
Timothy J. Ritzka
Assistant Attorney General
40 Capitol Square SW
Atlanta, GA 30334

Jamie Sykes
Richard B. Russell Project Office
4144 Russell Dam Drive
Elberton, GA 30635

Frank S. Holleman III
Wyche Burgess Freeman & Parham, P.A.
44 East Camperdown Way
Greenville SC 29601-3591

Mr. Paul Doody
ARCADIS
6723 Towpath Road
Syracuse, NY 13214-0066

Mr. Ronald Cardwell
McNair Law Firm, P.A.
Post Office Box 447
Greenville, SC 29602

Ms. Celeste T. Jones
McNair Law Firm, P.A.
Post Office Box 11390
Columbia, SC 29211

March 2011 Monthly Report
Sangamo Weston/Twelvemile Creek/Lake Hartwell Superfund Site
Operable Unit 2

Activities Initiated/Completed

- Dredge Clare initiated dredging in the Woodside II (WSII) Impoundment, and performed dredging on the south side up to approximately STA 59+50 on pass 1 of 3.
- Dredge Kami continued to dredge on the north side in WSII, and performed dredging on the north side up to approximately STA 57+60 on pass 1 of 3.
- Completed demolition of the WSI dam.
- Initiated and continued deconstruction of the access road built to facilitate access to the WSI dam during demolition, and performed associated grading near WSI.
- Initiated and continued construction of crane pad at WSII dam.
- Initiated and completed demolition of brick building on the downstream side of WSII dam.
- Initiated and continued to disassemble the penstock at WSII dam.
- On March 3, 2011, the Honorable G. Ross Anderson visited the Site.
- On March 7, 2011, SCDHEC Solid Waste Management Regional personnel were onsite for a general visit/inspection and performed a Class Three Landfill Inspection in accordance with Regulation 61-107.19, Part V. The inspection indicated that the facility was operating properly, and no problems were observed. The completed Inspection Form is provided as Attachment 1.
- On March 29, 2011, Leon Harmon visited the site.

Results of Sampling, Tests, and Other Data

- Sampling and analysis is being conducted relative to the creek turbidity, and water treatment system (WTS) effluent water. Results for the effluent water are attached (Attachment 2) and the continuous turbidity monitoring data is available upon written request.
- Project photographs are included as Attachment 3.

Plans, Reports, and other Deliverables

- Analytical data related to samples collected from the WTS to assess water treatment effluent water were submitted to SCDHEC in the February Monthly Report (submitted March 28, 2011) in Attachment 2.
- Submitted draft dredge verification survey of STA 51+00 on March 18 to John Adams of Taylor Engineering for preliminary review.

Work Planned for April 2011

- Continue dredge verification surveys with submittal of each 500 foot section to the Special Receivers and their consultant.
- Continue placement of dredged sediment in SMU.
- Continue monitoring WTS discharge.
- Continue dredging in the WSII impoundment.
- Complete activities associated with demolition of the WSI dam (i.e., deconstruction of the access road, grading of the adjacent area, etc.).
- Continue construction of crane pad in WSII.
- Continue disassembly of the penstock at WSII.
- Meet with Trustee Council on April 26, 2011 in Greenville, SC.

Issues Encountered, Anticipated Delays, Solutions

- Extreme weather conditions (e.g., heavy rain, thunder/lightening) during the weeks ending March 6th and March 27th impacted site operations, including temporary suspension of dredging operation due to increased water elevations and safety concerns. Erosion and sediment controls were maintained and/or replaced as necessary.
- Changes to the upstream water level rendered the continuous monitoring system ineffective. To facilitate continued monitoring of turbidity during the dredging activities, industry recognized manual monitoring procedures are, and will continue to be used daily upstream and downstream of the dredging activities. Both the sampling and data review shall continue to be performed in accordance with the Final Design.
- As anticipated, sediment has been carried to the Ball's Beach area from areas upstream. An alternate launch location was used to maintain necessary access to the dredges.

ARCADIS

Attachment 1

Nick Harmar

D H E C
PROMOTE. PROTECT. PROSPER

Class Three Landfill Inspection Form
Regulation 61-107.19, Part V

Facility Name: 12 Mile Creek SMU Date/Time of Inspection 7 MAR 11

County: Pickens Permit #:

Reason for Inspection: X Routine; ____ Follow-up; ____ Complaint; ____ Other ____

Current Weather Conditions: Clear/Sticky 45°

Previous 24-hours: Rain Y (N) – If yes, amount 2" inches; High winds Y N

1 – Meets or exceeds regulatory requirements; 2A – Improvement needed (minor issues exist; corrective measures recommended); 2B – Improvement needed (moderate issues exist; corrective action required and scheduled); 3 – Unacceptable (serious issues and/or recurring issues with minimal or no corrective action taken – alleged regulatory or permit condition violations have occurred – enforcement referral required); Y – Yes: Meets or exceeds regulatory requirements; N – No: Corrective measures recommended that should be fixed by the next inspection or an agreed upon completion date; NA – Not applicable; NI – Not inspected

Procedures for Excluding Receipt of Unapproved Waste (258.20)

1. N/A Overall effectiveness of Special Waste Analysis and Implementation Plan (SWAIP)
2. Y N NA NI Trained waste screener present
3. Y N NA NI Random daily load inspections conducted and documented
4. Y N NA NI Records of unacceptable waste maintained
5. Y N NA NI Personnel training program on recognition of regulated hazardous waste and PCB waste
6. Y N NA NI Record of Notification to Department within 72-hours of hazardous or PCB waste receipt
7. Y N NA NI Unauthorized wastes removed from working face by the end of the operating day

Cover Material Requirements (258.21)

8. ____ ≥ 6" soil (short-term cover)
9. N/A Alternate Daily Cover (ADC)
10. V ____ ≥ 6" soil (long-term and/or intermediate cover)
11. Y N NA NI Adequate soil quantity available for cover

Control of (258.21, 22, 24, 25 and 37):

12. ____ Blowing litter
13. ____ Off-site odors
14. ____ Disease vectors
15. ____ Fires/Open burning
16. ____ Scavenging

Access Requirements (258.25)

17. ____ Condition of access controls
18. ____ Condition of all weather roads – entrance
19. ____ Condition of all weather – internal haul roads

Run-on/Run-off Controls (258.26)

20. ____ Condition of ditches/swales
21. ____ Condition of berms/terraces/downchutes
22. V ____ Condition of sedimentation ponds

Leachate Seeps (258.26 and 27)

23. N/A Leachate seep management

Liquid Restrictions (258.28)

24. ____ Free of unauthorized bulk or non-containerized liquids

Record Keeping Requirements (258.29)

25. Y N NA NI Required records are maintained in the landfill's operating record

Scale Requirements (258.30)

26. Y N (NA) NI Scales installed and functioning properly

Required Equipment to Operate Landfill (258.31)

27. (Y) N NA NI Required equipment operational – if not please provide details in comments as to the type of equipment down for repairs, impact to operations, and status on temporary replacement equipment

All-up

Certified Landfill Manager/Supervisor (258.32)

28. Y N (NA) NI Manager and supervisor certified by SCDHEC
29. Y N (NA) NI Certified manager or supervisor on-site

Leachate Collection System (258.33 and 34)

30. Y N (NA) NI Leachate handling agreement in place
31. ____ Leachate collection system management

Leachate Recirculation System (258 Subpart i and Permit)

32. ____ Leachate recirculation system management
33. Y N NA NI Required leachate recirculation reports/data contained in the landfill's operating record
34. ____ Leachate seep management
35. ____ Leachate collection system management

Testing of Municipal Solid Waste (MSW) Incinerator Ash (258.35)

36. Y N (NA) NI MSW incinerator ash management

Sign Requirements (258.36)

37. Y N (NA) NI Required signs posted

Condition of Monitoring Wells (258.51)

38. V ____ Monitoring well maintenance program

Working Face/Elevation (258.87)

39. (Y) N NA NI Method of elevation control with benchmark

Plans and Permit (Permit)

40. Y N NA NI Operating in accordance with approved plans and general permit
41. Y N NA NI Permitted engineering drawings available
42. Y N NA NI Permitted operational plan available
43. Y N NA NI Permitted stabilization/landscaping plan available
44. Y N NA NI Permitted contingency plan available
45. Y N NA NI Permitted approved groundwater-monitoring plan available
46. Y N NA NI Permitted closure plan available
47. Y N NA NI Permitted post-closure plan available

Name of those present during the inspection: ____

Comments: WORK WAS TAKING PLACE IN REMOVING THE WOODSIDE MILL DAM UPON INSPECTION.

Inspection Item	Corrective action required	Date to be completed

Additional comment page: Y (N) Photos taken: Y (N)

The signature below certifies that the SCDHEC Inspector has personally checked each item and has answered according to the true condition existing at the time of inspection.

ARCADIS
Facility Representative

Bill Ramsey
SCDHEC Inspector

ARCADIS

Attachment 2

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse
New York 13214-0066
Tel 315.446.9120
Fax 315.449.0017
www.arcadis-us.com

ENVIRONMENTAL

Mr. Dale Stoudemire, Manager
South Carolina Department of Health and Environmental Control
Bureau of Water/Water Pollution Control Division
Data Management Section
2600 Bull Street
Columbia, South Carolina 29201

Subject:
Schlumberger Technology Corporation, Twelvemile Creek Restoration Project
Pickens County, South Carolina
February 2011 Sampling Results Report

Date:
March 28, 2011

Contact:
Lance S. Ketcham

Phone:
315.671.9163

Email:
lance.ketcham@
arcadis-us.com

Our ref:
MT001019

Dear Mr. Stoudemire:

On behalf of Schlumberger Technology Corporation (STC), ARCADIS is providing a summary of sampling results for the Twelvemile Creek Restoration Project in Pickens County for the month of February 2011 in accordance with the October 15, 2009 letter from Butch Swygert of South Carolina Department of Health and Environmental Control (SCDHEC) to Chris Moody of ARCADIS and the August 9, 2010 SCDHEC construction operation approval memorandum, which replaces the March 11, 2010 SCDHEC construction operation approval memorandum. The August 9, 2010 approval memorandum upgrades the onsite water treatment plant to a Group III – Physical/Chemical facility with a maximum discharge of 8.64 million gallons per day (MGD).

Table 1 contains the daily discharge information from the water treatment plant to Twelvemile Creek. This data is recorded onsite and is reviewed by a South Carolina certified water treatment plant operator. The maximum daily discharge for February 2011 was 4.18 MGD on February 5. The average discharge from the water treatment plant for the month of February was 2.13 MGD.

Table 2 contains the results of the analyses described in Table 1 of the October 15, 2009 letter that were performed on the water treatment plant effluent during the month of February 2011. The Laboratory Services Reports from Rogers & Callcott Laboratory Services related to these tests are provided in Attachment A. The samples were analyzed for pH, temperature, total suspended solids and PCBs. The results of these tests were within the ranges outlined in the October 15, 2009 letter.

Table 3 summarizes the results of the whole effluent toxicity (WET) testing; the Laboratory Services Reports for these tests are provided in Attachment B. Two sampling events were conducted in the month of February because the first test was terminated due to control mortality. The WET testing results from the second event were within the ranges outlined in the October 15, 2009 letter.

If you have any questions on the above, please feel free to contact me.

Sincerely,

ARCADIS

Lance S. Ketcham
Principal Engineer

Copies:
Melinda Vickers, SCDHEC
Eric Kim, SCDHEC
Du'Bois J. Ferguson, STC
Gary Odom, STC
J. Paul Doody, ARCADIS

ARCADIS

Tables

Table 1. Daily Discharge from Water Treatment Plant for February 2011. Twelvemile Creek Restoration Project, Pickens County

Date	Discharge, MGD
Monthly Avg [1]	MR
Daily Max [1]	MR
2/1/2011	3.13
2/2/2011	2.57
2/3/2011	1.63
2/4/2011	3.28
2/5/2011	**4.18**
2/6/2011	1.33
2/7/2011	0.59
2/8/2011	1.86
2/9/2011	2.17
2/10/2011	2.07
2/11/2011	2.74
2/12/2011	3.08
2/13/2011	1.26
2/14/2011	3.77
2/15/2011	3.00
2/16/2011	1.02
2/17/2011	1.56
2/18/2011	0.91
2/19/2011	3.85
2/20/2011	1.58
2/21/2011	1.51
2/22/2011	2.36
2/23/2011	2.22
2/24/2011	2.77
2/25/2011	2.18
2/26/2011	1.66
2/27/2011	0.85
2/28/2011	0.36
Total	59.50
Days per Month	28
Average	2.13

Notes:

1. Data is from onsite records detailing the daily discharge volumes to Twelvemile Creek; a discharge of 0 MGD is recorded when the treatment plant is not operating or discharging to Twelvemile Creek. Discharge data was recorded by the South Carolina certified wastewater treatment plant operator from Rogers & Callcott.
2. The bolded value is the maximum daily discharge recorded.

Superscript Notes:

[1] Discharge reporting guidelines are outlined in the 10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control) to Chris Moody (ARCADIS).

Acronyms and Abbreviations:

Avg - average
Max - maximum
MGD - million gallons per day
MR - monitor and report

Table 2. Effluent Sampling Result for February 2011. Twelvemile Creek Restoration Project, Pickens County

Sample Number	Location	Sample Type	Week	Sample Date and Time	pH	Temp. (°C)	TSS (mg/L)	PCB (µg/L)						
								PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260
Monthly Avg. [1]	--	--	--	--	6.0 to 8.5	--	25	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Daily Max. [1]	--	--	--	--	6.0 to 8.5	--	45	0.5	0.5	0.5	0.5	0.5	0.5	0.5
AC94867	WTP Effluent Discharge	G	1	2/1/2011 09:00	6.2	8.0	NA	NA	NA	NA	NA	NA	NA	NA
AC94868	WTP Effluent Discharge	C		2/1/2011 08:55	NA	NA	8.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AC95366	WTP Effluent Discharge	G	2	2/8/2011 09:35	6.0	6.6	NA	NA	NA	NA	NA	NA	NA	NA
AC95367	WTP Effluent Discharge	C		2/8/2011 09:30	NA	NA	6.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AC95825	WTP Effluent Discharge	G	3	2/15/2011 08:59	6.3	8.5	NA	NA	NA	NA	NA	NA	NA	NA
AC95826	WTP Effluent Discharge	C		2/15/2011 08:45	NA	NA	2.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AC96098	WTP Effluent Discharge	G	4	2/22/2011 08:55	6.0	15.3	NA	NA	NA	NA	NA	NA	NA	NA
AC96099	WTP Effluent Discharge	C		2/22/2011 08:50	NA	NA	< 2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
				Average	6.1	9.6	5.1	-	-	-	-	-	-	-

Notes:

1. Sampling results complied from Laboratory Services Reports provided by Rogers & Callcot Laboratory Services and submitted in tabular form as required per the10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control [SCDHEC]) to Chris Moody (ARCADIS) and the 3/11/2010 SCDHEC construction and operational approval memorandum.
2. The monthly average includes non-detect readings as indicated by "<" (if applicable) and assumes a value equal to the detection limit. Monthly averages are not calculated for parameters without a detected concentration (indicated by

Superscript Note:

[1] Discharge reporting guidelines and limits are outlined in the 10/15/2009 letter from Butch Swygert (SDHEC) to Chris Moody (ARCADIS)

Acronyms and Abbreviations:

°C - degrees centigrade
G - grab sample
C - 24-hour composite sample
µg/L - micrograms per liter
MGD - million gallons per day
mg/L - milligrams per liter
NA - not analyzed
PCB - polychlorinated biphenyl
Temp. - temperature

Table 3. Whole Effluent Toxicity Result for February 2011. Twelvemile Creek Restoration Project, Pickens County

WET Analysis	Monthly Avg.[1]	Daily Max.[1]	Event 1 Results	Event 2 Results
Ceriodaphnia dubia Chronic WET @ CTC=17.4%	25%	40%	--	1.3%
Ceriodaphnia dubia Chronic WET-Reproduction @ CTC=17.4%	MR, %	MR, %	--	1.3%
Ceriodaphnia dubia Chronic WET-Survival @ CTC=17.4%	MR, %	MR, %	--	0.0%
Ceriodaphnia dubia Acute WET @ ATC=35.5%	--	0[2]	--	0

Notes:

1. WET testing was performed by ETT.
2. Results of the WET testing are presented as the percent reduction relative to the control sample.
3. Samples for Event 1 were collected on 2/1, 2/3, and 2/4/2011. One composite sample was collected each day (sample numbers AC94831, AC94915, and AC95182, respectively) to complete the Chronic WET testing. Sample AC94831was used in the Acute WET testing. Event 1 testing was terminated due to control mortality.
4. Samples for Event 2 were collected on 2/15, 2/16, and 2/18/2011. One composite sample was collected each day (sample numbers AC95776, AC95790, and AC96052, respectively) to complete the Chronic WET testing. Sample AC95776 was used in the Acute WET testing.
5. Shaded values indicate that the results are not within the ranges outlined in the 10/15/2009 letter.

Superscript Notes:

[1] Discharge reporting guidelines and limits are outlined in the 10/15/2009 letter from Butch Swygert (South Carolina Department of Health and Environmental Control) to Chris Moody (ARCADIS).

[2] A results of "0" indicates a passing result.

Acronyms and Abbreviations:

MR - monitor and report

NA - not analyzed

WET - whole effluent toxicity

ARCADIS

Attachments

ARCADIS

Attachment A

Laboratory Services Report:
October 15, 2009 Table 1
Analyses

ROGERS & CALLCOTT
LABORATORY SERVICES
P.O. Box 5655, Greenville, SC 29606
® Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Received: 02/01/2011
Time Received: 12:10
Date Reported: 02/04/2011

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC94867	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 02/01/2011 at 09:00
AC94868	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/01/2011 at 08:55

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: Rebecca L. Musick
authorized signature

Results reviewed by:

Carbon copy: Email to L Ketcham S Handley A Kohler S Cary

Sample Number	Sample Description, Date and Time Collected
AC94867	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 02/01/2011 at 09:00

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
pH (Field)	6.2	pH units		0.1	02/01/2011 09:00	LRW	SM 4500HB
Temperature (Field)	8.0	degrees C		0.1	02/01/2011 09:00	LRW	SM 2550B

Sample Number	Sample Description, Date and Time Collected
AC94868	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/01/2011 at 08:55

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
3 to 5 day turn around	Completed				02/04/2011 00:00		
Total Suspended Solids	8.8	mg/l		2.0	02/01/2011 12:25	JLA	SM 2540D
Polychlorinated Biphenyls (PCBs)							
PCB-1016	< RDL	ug/l		0.5	02/03/2011 00:40	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	02/03/2011 00:40	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	02/03/2011 00:40	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	02/03/2011 00:40	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	02/03/2011 00:40	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	02/03/2011 00:40	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	02/03/2011 00:40	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate	98	%		0	02/03/2011 00:40	RKH	EPA 608
Decachlorobiphenyl, (Surrorate)	94	%		0	02/03/2011 00:40	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				02/01/2011 13:30	DBB	EPA 608

ROGERS & CALLCOTT LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Client Name SCHLUMBERGER

Address

Report To:

Telephone No. FAX No.

PO No. Project No. TMC

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS									
AC 948668	2/1	0855	WASTE TREATMENT PLANT EFFLUENT DISCHARGE	2	TSS	PCB								
					1	1+N								
					N	N								Filtered (Yes/No)
					Y	Y								Cooled (Yes/No)
					P	G								Container Type (P/G)
					½C	2½L								Container Volume
					C	C								Sample Type (Grab/Composite)
					WW	WW								Sample Source (WW, GW, DW, Other)
					N	N								Sample Source Chlorinated (Yes/No)
					NA	Yes								Lab Receipt Cl$_2$ Check MCA 2-1-11
					NA	7								Lab Receipt pH Check
					A	A								Preserved (Code)

A-None D-NaOH G-Boric Acid
B-HNO_3 E-HCL H-Ascorbic Acid
C-H_2SO_4 F-$Na_2S_2O_3$ I- ____

COMMENTS:

SAMPLES SET-UP @ 0855 ON 1/31/11. TIME PROP. BY R+C

AC948667

PH 6.2 } GRAB TAKEN +
TEMP 8.0C } READ @ 0900 ON 2/1/11 BY R+C

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time	KNOWN HAZARDS ASSOCIATED WITH SAMPLES
① [signature]	2.1.11 | 1210	② [signature] Shipper Name & #	2.1.11 | 1210	
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time	
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time	Temperature of blank or representative sample: At time of collection 3.0 °C; At time of lab receipt 1.1 °C
Seal # at'chd by ○	Recvd. Intact by ○	Seal # at'chd by ○	Recvd. Intact by ○	

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Received: 02/08/2011
Time Received: 12:10
Date Reported: 02/10/2011

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC95366	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 02/08/2011 at 09:35
AC95367	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/08/2011 at 09:30

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: _____
authorized signature

Results reviewed by: _____

Carbon copy: Email to L Ketcham S Handley A Kohler S Cary

Sample Number	Sample Description, Date and Time Collected
AC95366	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 02/08/2011 at 09:35

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
pH (Field)	6.0	pH units		0.1	02/08/2011 09:35	LRW	SM 4500HB
Temperature (Field)	6.6	degrees C		0.1	02/08/2011 09:35	LRW	SM 2550B

Sample Number	Sample Description, Date and Time Collected
AC95367	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/08/2011 at 09:30

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
3 to 5 day turn around	Completed				02/10/2011 00:00		
Total Suspended Solids	6.8	mg/l		2.0	02/08/2011 14:20	JLA	SM 2540D
Polychlorinated Biphenyls (PCBs)							
PCB-1016	< RDL	ug/l		0.5	02/10/2011 01:14	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	02/10/2011 01:14	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	02/10/2011 01:14	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	02/10/2011 01:14	RKH	EPA 608
PCB-1248	< RDL	ug/l	P	0.5	02/10/2011 01:14	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	02/10/2011 01:14	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	02/10/2011 01:14	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate	102	%		0	02/10/2011 01:14	RKH	EPA 608
Decachlorobiphenyl, (Surrorate)	91	%		0	02/10/2011 01:14	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				02/08/2011 13:00	DBB	EPA 608

ROGERS & CALLCOTT LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

Client Name: SCHLUMBERGER

Address:

Report To:

Telephone No.: FAX No.:

PO No.: Project No.: TMC

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: TSS	PCB							
Filtered (Yes/No)					N	N							
Cooled (Yes/No)					Y	Y							
Container Type (P/G)					P	G							
Container Volume					½C	4L							
Sample Type (Grab/Composite)					C	C							
Sample Source (WW, GW, DW, Other)					WW	WW							
Sample Source Chlorinated (Yes/No)					N	N							
Lab Receipt Cl$_2$ Check					NA	neg							
Lab Receipt pH Check					NA	neutral							
Preserved (Code)					A	A							
AC	95366	2/8	0930	WATER TREATMENT PLANT* EFF. DISCH.	3	2	1	-N					

A-None B-HNO_3 C-H_2SO_4 D-NaOH E-HCL F-$Na_2S_2O_3$ G-Boric Acid H-Ascorbic Acid I- ____

COMMENTS:

SAMPLER SET OUT @ 0930 ON 2/7/11 TIME PROP. BY R&C

AC95366

PH 6.0 GRAB TAKEN

TEMP 6.6C + READ @ 0935 ON 2/8/11 BY R&C

	Date/Time		Date/Time
SAMPLER Relinquished by (Sig.) ①	2/8/11 1210	Received by (Sig.) ② Shipper Name & # Cindy Hoglo	2/8/11 1210
Relinquished by (Sig.) ③		Received by (Sig.) ④ Shipper Name & #	
Relinquished by (Sig.) ⑤		Received by (Sig.) ⑥ Shipper Name & #	

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

*SUFFICIENT SAMPLE FOR FIELD DUPLICATES

02-03-11 P12:10

Temperature of blank or representative sample

At time of collection 2.6 °C

At time of lab receipt 1.8 °C

ROGERS & CALLCOTT
LABORATORY SERVICES
P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Received: 02/15/2011
Time Received: 11:55
Date Reported: 02/17/2011

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC95825	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 02/15/2011 at 08:59
AC95826	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/15/2011 at 08:45

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: _____ ***Results reviewed by:*** _____
authorized signature

Carbon copy: Email to L Ketcham S Handley A Kohler S Cary

Sample Number	Sample Description, Date and Time Collected
AC95825	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 02/15/2011 at 08:59

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
pH (Field)	6.3	pH units		0.1	02/15/2011 08:59	JTH	SM 4500HB
Temperature (Field)	8.5	degrees C		0.1	02/15/2011 08:59	JTH	SM 2550B

Sample Number	Sample Description, Date and Time Collected
AC95826	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/15/2011 at 08:45

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
3 to 5 day turn around	Completed				02/17/2011 00:00		
Total Suspended Solids	2.8	mg/l		2.0	02/15/2011 14:07	JLA	SM 2540D
Polychlorinated Biphenyls (PCBs)							
PCB-1016	< RDL	ug/l		0.5	02/17/2011 06:45	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	02/17/2011 06:45	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	02/17/2011 06:45	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	02/17/2011 06:45	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	02/17/2011 06:45	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	02/17/2011 06:45	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	02/17/2011 06:45	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate	101	%		0	02/17/2011 06:45	RKH	EPA 608
Decachlorobiphenyl, (Surrorate)	102	%		0	02/17/2011 06:45	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				02/15/2011 13:30	CGW	EPA 608

ROGERS & CALLCOTT
LABORATORY SERVICES
P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

Client Name SCHLUMBERGER

Address

Report To:

Telephone No. FAX No.

PO No. Project No. TMC

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS									
					TSS	PCB								
					N	N								Filtered (Yes/No)
					Y	Y								Cooled (Yes/No)
					P	G								Container Type (P/G)
					½G	2½L								Container Volume
					C	C								Sample Type (Grab/Composite)
					WW	WW								Sample Source (WW, GW, DW, Other)
					N	N								Sample Source Chlorinated (Yes/No)
					NA	Neg								Lab Receipt Cl$_2$ Check mcs/2-17-11
					NA	7								Lab Receipt pH Check
					A	A								Preserved (Code)
AC 95826	2-15	845	WWTP EFF. DISCH.	2	1	1	+N							SAMPLER SET UP @ 845 ON 2/14/11, TIME PROP., BY R+C
														AC95825 pH 6.3 / GRAB TAKEN Temp 8.5°C + READ 8.5°C 2/15/11 ON 2/15/11 BY R+C

A-None D-NaOH G-Boric Acid
B-HNO_3 E-HCL H-Ascorbic Acid
C-H_2SO_4 F-$Na_2S_2O_3$ I- ____

COMMENTS:

	Date/Time		Date/Time	
SAMPLER Relinquished by (Sig.) ①	2-15-11 1155	Received by (Sig.) ② Norma Salley Shipper Name & #	2-15-11	1155
Relinquished by (Sig.) ③		Received by (Sig.) ④ Shipper Name & #		
Relinquished by (Sig.) ⑤		Received by (Sig.) ⑥ Shipper Name & #		

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

Temperature of blank or representative sample
At time of collection 0.2 ref °C
At time of lab receipt 0.4 NOT FROZEN °C

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Received: 02/22/2011
Time Received: 11:40
Date Reported: 02/24/2011

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC96098	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 02/22/2011 at 08:55
AC96099	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/22/2011 at 08:50

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: Amy J Ashley
authorized signature

Results reviewed by: SJG

Carbon copy: Email to L Ketcham S Handley A Kohler S Cary

Sample Number	Sample Description, Date and Time Collected
AC96098	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge grab, collected on 02/22/2011 at 08:55

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
pH (Field)	6.0	pH units		0.1	02/22/2011 08:55	LRW	SM 4500HB
Temperature (Field)	15.3	degrees C		0.1	02/22/2011 08:55	LRW	SM 2550B

Sample Number	Sample Description, Date and Time Collected
AC96099	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/22/2011 at 08:50

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
3 to 5 day turn around	Completed				02/24/2011 00:00		
Total Suspended Solids	< RDL	mg/l		2.0	02/22/2011 11:49	JLA	SM 2540D
Polychlorinated Biphenyls (PCBs)							
PCB-1016	< RDL	ug/l		0.5	02/24/2011 02:03	RKH	EPA 608
PCB-1221	< RDL	ug/l		0.5	02/24/2011 02:03	RKH	EPA 608
PCB-1232	< RDL	ug/l		0.5	02/24/2011 02:03	RKH	EPA 608
PCB-1242	< RDL	ug/l		0.5	02/24/2011 02:03	RKH	EPA 608
PCB-1248	< RDL	ug/l		0.5	02/24/2011 02:03	RKH	EPA 608
PCB-1254	< RDL	ug/l		0.5	02/24/2011 02:03	RKH	EPA 608
PCB-1260	< RDL	ug/l		0.5	02/24/2011 02:03	RKH	EPA 608
2,4,5,6-Tetrachloro-m-xylene, (Surrogate	95	%		0	02/24/2011 02:03	RKH	EPA 608
Decachlorobiphenyl, (Surrorate)	90	%		0	02/24/2011 02:03	RKH	EPA 608
Liquid-liquid Extraction Pest/PCB 608	Completed				02/22/2011 12:00	DBB	EPA 608

ROGERS & CALLCOTT LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

Client Name: Schumberger

Address:

Report To:

Telephone No.: FAX No.:

PO No.: Project No.: TMC

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: TSS	PCB	Filtered (Yes/No)	Cooled (Yes/No)	Container Type (P/G)	Container Volume	Sample Type (Grab/Composite)	Sample Source (WW, GW, DW, Other)	Sample Source Chlorinated (Yes/No)	Lab Receipt Cl2 Check	Lab Receipt pH Check	Preserved (Code)	COMMENTS:
							N	N									
							Y	Y									
							P	G									
							½L	2½L									
							C	C									
							WW	WW									
							N	N									
							NA	Acq									
							NA	7									
							A	A									
AC 96099	2/22	0850	WASTE TREATMENT PLANT EFFLUENT DISCHARGE	2	1	1-2											SAMPLER SET-UP @ 0850 ON 2/21/11 TIME prop. By R+C AC96098 pH 6.0 GRAB TAKEN Temp 15.3°C READ @ 0855 ON 2/22/11 By R+C

Preserved (Code): A-None, B-HNO_3, C-H_2SO_4, D-NaOH, E-HCl, F-$Na_2S_2O_3$, G-Boric Acid, H-Ascorbic Acid, I- ____

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time
①	2.22.11 | 1140	② Shipper Name & #	2.22.11 | 1140
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time
Seal # at'chd by ○	Recvd. Intact by ○	Seal # at'chd by ○	Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

Temperature of blank or representative sample
At time of collection 3.2 °C
At time of lab receipt 4.7 °C

ARCADIS

Attachment B

Laboratory Services Report:
Whole Effluent Toxicity Testing

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Reported: 02/15/2011

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC94831	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/01/2011 at 08:55
AC94915	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/03/2011 at 09:10
AC95182	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/04/2011 at 09:12

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: Rebecca L. Musick
authorized signature

Results reviewed by: SG

Carbon copy: Email to L Ketcham S Handley A Kohler S Cary

Case Narrative

AC94831 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/01/2011 at 08:55

Composite sample AC94831 was subcontracted to ETT for Acute and Chronic Toxicity tests.

AC94915 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/03/2011 at 09:10

This sample was an additional composite subcontracted to complete the Chronic Toxicity testing.

AC95182 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/04/2011 at 09:12

This sample was an additional composite subcontracted to complete the Chronic Toxicity testing.

Sample Number	Sample Description, Date and Time Collected
AC94831	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/01/2011 at 08:55

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				02/15/2011 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 9 pages for Acute and Chronic Toxicity from ETT Environmental Inc.

Sample Number	Sample Description, Date and Time Collected
AC94915	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/03/2011 at 09:10

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				02/15/2011 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 9 pages for Acute and Chronic Toxicity from ETT Environmental Inc.

Sample Number	Sample Description, Date and Time Collected
AC95182	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/04/2011 at 09:12

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				02/15/2011 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 9 pages for Acute and Chronic Toxicity from ETT Environmental Inc.

ETT environmental, inc.
P.O. Box 16414, Greenville, SC 29606
(864) 877-6942 • Fax (864) 877-6038
4 Craftsman Court, Greer, SC 29650

Ceriodaphnia dubia Survival and Reproduction Test

EPA-821-R-02-013 Method 1002

Test Species: *Ceriodaphnia dubia*

Client: SCHLUMBERGER
Facility: EFFLUENT
NPDES #: SC

Test Date: 01-Feb-11

Laboratory ID#: T37184
INVALID TEST

Test Reviewed and Approved By:

Robert W. Kelley, Ph.D.
Laboratory Manager

[redacted] **Certification #E87819**
Test results presented in this report conform to all requirements of NELAC, conducted under NELAC Certification Number E87819 Florida Dept. of Health. Included results pertain only to provided samples.

SCDHEC Certification #23104

NCDENR Certification # 022

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

DMR Attachment for Chronic Multi-Concentration Whole Effluent Toxicity Test Results Using Linear Interpolation

TWELVE MILE CREEK RESTORATION P Permit number SC Discharge number

FINAL LIMITS 04/01/2010- Parameter Code TCP3B MLOC=1 CTC= 17.40% effluent

		Year	Month	Day		Year	Month	Day
Monitoring period	From	11	2	1	To	11	2	28

Date 01-Feb-11

Lab ID 23104

IC25= N/A

48 hr Chronic LC50 = N/A

	Mortality Data		Reproduction Data	
Group	# Adults	# Dead	Group Average	Group Variance
0	10	10	0.0	0.00
8	10	0	0.0	0.00
17.4	10	0	0.0	0.00
35	10	1	0.0	0.00
50	10	0	0.0	0.00
100	10	10	0.0	0.00

% Survival Effect at CTC= N/A

% Reproduction Effect at CTC= N/A

Invalid test due to control mortality

Date

Lab ID 23104

IC25=

48 hr Chronic LC50 =

	Mortality Data		Reproduction Data	
Group	# Adults	# Dead	Group Average	Group Variance

% Survival Effect at CTC=

% Reproduction Effect at CTC=

Signature of Principal Executive Officer or Authorized Agent _____

Name/Title of Principal Executive Officer (*typed or printed*) _____

DHEC 3710 (8/05)

CHRONIC DEFINITIVE SURVIVAL AND REPRODUCTION/GROWTH TEST
Statistical Analyses

Client: **TWELVE MILE CREEK RESTORATION PROJECT**

Sample Identification: **EFFLUENT**

Test Date: **01-Feb-2011**

Tests for Normality and Heterogeneity of Variance

Parameter	*Test Used*	*Result*
Normality	N/A	N/A
Variance	N/A	N/A

Sample Use

	Sample Date	Sample Used		
Sample A	01-Feb-11	01-Feb-11	02-Feb-11	
Sample B	03-Feb-11	03-Feb-11	04-Feb-11	
Sample C	05-Feb-11	05-Feb-11	06-Feb-11	07-Feb-11

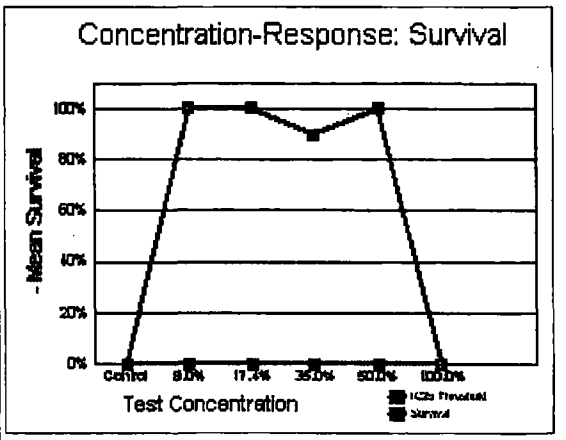
Tests for Differences in Survival and Reproduction

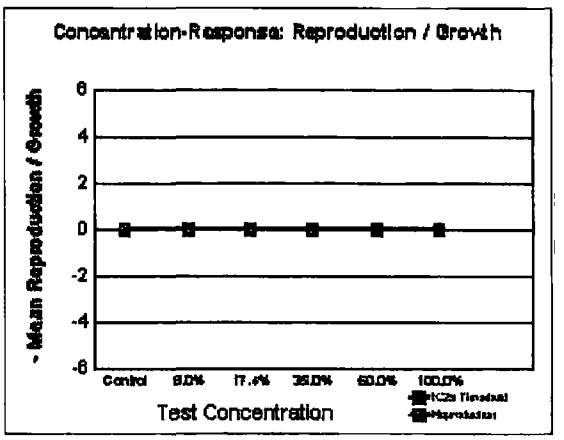
Test Type Used: **Linear Interpolation**

		% Effluent					
Effect	**Control**	8.0%	17.4%	35.0%	50.0%	100.0%	
Survival	0.0%	100.0%	100.0%	90.0%	100.0%	0.0%	
% reduction		0.0%	0.0%	0.0%	0.0%	100.0%	
Reproduction	0.0	0.0	0.0	0.0	0.0	0.0	
% reduction (smoothed)		N/A	N/A	N/A	N/A	N/A	
Variance	0.00	0.00	0.00	0.00	0.00	0.00	

Acceptability Criteria	Value	Upper Limit	Lower Limit
CV:Coeff. of Variation	N/A	42.0%	8.9%
PMSD: % MSD	N/A	37.0%	11.0%
MSD:Min. Sign. Diff.	0.0	N/A	

IC25 Point Estimates		**TEST RESULTS**	
Survival	IC25= N/A	%Reduction per Linear Interpolation	
Reproduction	IC25= N/A	@CTC of	17.4%
Hypothesis Testing		Survival effect	N/A
NOEC Reproduction	N/A	Reproduction effect	N/A
ChV Reproduction	N/A		N/A





Comments

Test terminated on Day 4 due to mortality.

Control mortality may have resulted from volatiles in effluent.

source	rep	Test Day 1	2	3	4	5	6	7	8	Total	
14 1-21	A				D					0	control
R1 1-20	B				D					0	
A9 1-20	C				D					0	
A8 1-20	D				D					0	
Q3 1-20	E			D						0	
Q1 1-20	F			D						0	
S4 1-21	G				D					0	
T9 1-21	H				D					0	
AA3 1-21	I				D					0	
AA4 1-21	J				D					0	0.0
8	A									0	
	B									0	
	C									0	
	D									0	
	E									0	
	F									0	
	G									0	
	H									0	
	I									0	Mean
	J									0	0.0
17.4	A									0	
	B									0	
	C									0	
	D									0	
	E									0	
	F									0	
	G									0	
	H									0	
	I									0	Mean
	J									0	0.0
35	A									0	
	B									0	
	C									0	
	D									0	
	E									0	
	F									0	
	G									0	
	H			D						0	
	I									0	Mean
	J									0	0.0
50	A									0	
	B									0	
	C									0	
	D									0	
	E									0	
	F									0	
	G									0	
	H									0	
	I									0	Mean
	J									0	0.0
100	A	D								0	
	B		D							0	
	C			D						0	
	D		D							0	
	E		D							0	
	F		D							0	
	G		D							0	
	H	D								0	
	I		D							0	Mean
	J	D								0	0.0
renew		AE	AE	JC					End Date		
fed		AE	AE	JC					04-Feb-11		
time fed & renew		02:24 PM	04:09 PM	10:28 AM					10:25 AM	JC	
New temp. °C		25.3	25.3	25.3							
Old temp. °C		25.5	24.7	24.9							

D=Dead N/A-Lost or not used

Lab#	T37184
Client	SCHLUMBERGER
Sample ID	EFFLUENT
NPDES#	SC
County	0
Month	2
Start & fed Date	01-Feb-11
Start & fed Time	1600
Started & fed By	AE
Test Organism	Ceriodaphnia dubia
Neo. born date	31-Jan-11
Neo. born time	BATCH 2
Test Type	SCCD
Dilution Water	MHSF
Units for Conc.	%
%3rd BROOD	
Test vessels	30 ml
Test volume	15 ml
Incubator #	1
Light	16lt/8dk
Initial Temp °C	25
Selenastrum	0.05 ml
YAT	0.05 ml
Test method	EPA 821-R-02-013:1002

Comments

TEST TERMINATED ON DAY 4 DUE TO MORTALITY IN CONTROL. NO FURTHER TEST DATA RECORDED ON DAY 4 BUT MORTALITY NOTICED THROUGHOUT. RESTARTED ON 2-5-11 WITH C SAMPLE.

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

Client Name: Rogers & Callcott

Address: ____

Report To: ____

Telephone No. ____ FAX No. ____

PO No. ____ Project No. TMC

Field	Value
Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	½G
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl_2 Check	
Lab Receipt pH Check	
Preserved (Code)	A

Preserved (Code): A–None, B–HNO_3, C–H_2SO_4, D–NaOH, E–HCL, F–$Na_2S_2O_3$, G–Boric Acid, H–Ascorbic Acid, I– ____

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: Acute+Chronic Toxicity	COMMENTS: 37184A/37185
AC 94831	2/1	0855	WATER TREATMENT PLANT EFF. DISCH. *	1	1	Sampler set out @ 0855 on 1/31/11 Time proportional By R+C

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time
① [signature]	2/1/11 1340	② [signature] Shipper Name & #	2/1/11 1340
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time

Seal # ____ at'chd by ○ Recvd. Intact by ○ Seal # ____ at'chd by ○ Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* DELIVERED TO ETT LAB

Temperature of blank or representative sample
At time of collection ____ °C
At time of lab receipt 2.4 °C

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT LABORATORY SERVICES

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Greenville, SC 29607

CHAIN OF CUSTODY RECORD

PAGE 1 of 1

Client Name ROGERS + CALLCOTT

Address

Report To:

Telephone No. FAX No.

PO No. Project No. TMC

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: Chronic Toxicity
AC 94915	2/3	0910	WATER TREATMENT PLANT * EFF. DISCHARGE	1	1

Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	½G
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl2 Check	
Lab Receipt pH Check	
Preserved (Code)	A

A-None D-NaOH G-Boric Acid
B-HNO_3 E-HCL H-Ascorbic Acid
C-H_2SO_4 F-$Na_2S_2O_3$ I- ____

COMMENTS:

ETT Log # 37184B
Sampler set-up @ 0910 on 2/2/11, Time proportional By R+C

SAMPLER Relinquished by (Sig.) ①	Date/Time 2/3/11 1400	Received by (Sig.) ② Brent Boyd Shipper Name & #	Date/Time 2/3/11 1400
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time
Seal # at'chd by ○	Recvd. Intact by ○	Seal # at'chd by ○	Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* DELIVERED TO ETT LAB

Temperature of blank or representative sample
At time of collection ____ °C
At time of lab receipt .5 °C

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT LABORATORY SERVICES

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CHAIN OF CUSTODY RECORD

PAGE 1 1

Client Name ROGERS + CALLCOTT

Address

Report To:

Telephone No. FAX No.

PO No. Project No. TMC

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: CHRONIC TOXICITY	Filtered (Yes/No)	Cooled (Yes/No)	Container Type (P/G)	Container Volume	Sample Type (Grab/Composite)	Sample Source (WW, GW, DW, Other)	Sample Source Chlorinated (Yes/No)	Lab Receipt Cl2 Check	Lab Receipt pH Check	Preserved (Code)
					A	N	Y	P	½G	C	WW	N			A
AC 95182	2/4	0912	WASTEWATER TREATMENT PLANT* EFF. DISCH.	1	1										

A–None B–HNO_3 C–H_2SO_4 D–NaOH E–HCL F–$Na_2S_2O_3$ G–Boric Acid H–Ascorbic Acid I– ____

COMMENTS:

37184C

SAMPLER SET UP @ 0912 ON 2/3/11. TIME prop. BY R+C

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time	KNOWN HAZARDS ASSOCIATED WITH SAMPLES
① [signature]	2/4/11 1425	② [signature] EIT Shipper Name & #	2/4/11 1425	* DELIVERED TO EIT LAB
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time	
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time	Temperature of blank or representative sample: At time of collection 2.7 °C; At time of lab receipt 1.4 °C

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

Form Revised July 2008

R/C COC FORM

PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

DMR Attachment for Pass/Fail Whole Effluent Toxicity Test Results

TWELVE MILE CREEK RESTORATION PROJE Permit number SC Discharge number

FINAL LIMITS 04/01/2010- Parameter TGA3B MLOC=1 ATC=35.50% effluent

Monitoring period		Year	Month	Day		Year	Month	Day
	From	11	2	01	To	11	2	28

Mortality Data - Acute and Chronic Tests — Reproduction Data-Chronic Tests Only

Date 01-Feb-11
Lab ID 23104

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control	20	0				
Test	20	5	FAIL			

Mortality Data - Acute and Chronic Tests — Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests — Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests — Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests — Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests — Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Signature of Principal Executive Officer or Authorized Agent ______________________

Name/Title of Principal Executive Officer (*typed or printed*) ______________________

DHEC 3420 (8/05)

Control Survival and Reproduction by Test Day

source	rep	1	2	3	4	5	6	7	8	Total	
A-F,1/20	A		0							0	
M-R,1/20	A		0							0	
S-X,1/21	A		0							0	
RANDOM	A		0							0	
IZED	A		0							0	
	B		0							0	
	B		0							0	
	B		0							0	
	B		0							0	
	B		0							0	
	C		0							0	
	C		0							0	
	C		0							0	
	C		0							0	
	C		0							0	
	D		0							0	
	D		0							0	
	D		0							0	
	D		0							0	Mean
	D		0							0	0.0

35.5 % Effluent Survival and Reproduction by Test Day

		1	2	3	4	5	6	7	8	Total	
A-F,1/20	A		0							0	
M-R,1/2	A		D							0	
S-X,1/21	A		D							0	
RANDO	A		0							0	
IZED	A		0							0	
0	B		0							0	
0	B		D							0	
0	B		0							0	
0	B		0							0	
0	B		D							0	
0	C		0							0	
0	C		0							0	
0	C		0							0	
0	C		0							0	
0	C		0							0	
0	D		0							0	
0	D		0							0	
0	D		0							0	
0	D		D							0	Mean
0	D		0							0	0.0

										04-Feb-11	
										04:47 PM	BB
Old temp. °C											*******
											10:54 AM

D=Dead N/A-Lost or not used

[redacted]	T37185
[redacted]	SCHLUMBERGER
[redacted]	EFFLUENT
[redacted]	SC
[redacted]	0
[redacted]	2
[redacted]	2/2/11
[redacted]	1630
[redacted]	BB
[redacted]	Ceriodaphnia dubia
[redacted]	2/1/11
[redacted]	BATCH 2
[redacted]	SCAPF
[redacted]	MHSF
[redacted]	%
[redacted]	35.5
[redacted]	
[redacted]	30 ml
[redacted]	15 ml
[redacted]	1
[redacted]	16lt/8dk
[redacted]	25.1
[redacted]	0.05 ml
[redacted]	0.05 ml
[redacted]	EPA 821-R-02-013:1002

Comments

ROGERS & CALLCOTT
LABORATORY SERVICES
P.O. Box 5655, Greenville, SC 29606
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Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

Client Name: Rogers & Callcott
Address: ______
Report To: ______
Telephone No. ______ FAX No. ______
PO No. ______ Project No. TMC

Field	Value
Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	½G
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl_2 Check	
Lab Receipt pH Check	
Preserved (Code)	A

Preserved codes: A–None, B–HNO_3, C–H_2SO_4, D–NaOH, E–HCL, F–$Na_2S_2O_3$, G–Boric Acid, H–Ascorbic Acid, I– ____

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: Acute/Chronic Toxicity	COMMENTS
14851	2/1	0855	Water treatment plant Eff. Ditch *	1	1	Sampler set out @ 0855 on 1/31/11 Time proportional By R&C

Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time
SAMPLER ① [signature]	2/1/11 1340	② [signature] Shipper Name & #	2/1/11 1340
③		④ Shipper Name & #	
⑤		⑥ Shipper Name & #	

Seal # ____ at'chd by ○ Recvd. Intact by ○ Seal # ____ at'chd by ○ Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES
* Delivered to ETT Lab

Temperature of blank or representative sample
At time of collection ____ °C
At time of lab receipt 24 °C

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT LABORATORY SERVICES

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Client Name ROGERS + CALLCOTT

Address

Report To:

Telephone No. FAX No.

PO No. Project No. TMC

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: Chronic Toxicity
AC 94915	2/3	0910	WASTEWATER TREATMENT PLANT * EFF. DISCHARGE	1	1

Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	4L
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl$_2$ Check	
Lab Receipt pH Check	
Preserved (Code)	A

A-None D-NaOH G-Boric Acid
B-HNO_3 E-HCL H-Ascorbic Acid
C-H_2SO_4 F-$Na_2S_2O_3$ I- ____

COMMENTS:

Sampler set to T@ 0910 on 2/2/11, Time proportional By R+C

SAMPLER Relinquished by (Sig.) ①	Date/Time 2/3/11 1400	Received by (Sig.) ② Brent Bagwell Shipper Name & #	Date/Time 2/3/11 1400
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time
Seal # at'chd by ○	Recvd. Intact by ○	Seal # at'chd by ○	Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES
* DELIVERED TO ETT LAB

Temperature of blank or representative sample
At time of collection ____ °C
At time of lab receipt .5 °C

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT LABORATORY SERVICES

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

Client Name ROGERS + CALLCOTT

Address

Report To:

Telephone No. FAX No.

PO No. Project No. TMC

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: CHRONIC TOXICITY
AC 015182	2/4	@912	WASTEWATER TREATMENT PLANT* EFF. DISCH.	1	1

Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	½G
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl, Check	
Lab Receipt pH Check	
Preserved (Code)	A

A-None D-NaOH G-Boric Acid
B-HNO_3 E-HCL H-Ascorbic Acid
C-H_2SO_4 F-$Na_2S_2O_3$ I- ____

COMMENTS:

SAMPLER Relinquished by (Sig.) ① Date/Time 2/4/11 | 1425

Received by (Sig.) ② Shipper Name & # EIT Date/Time 2/4/11 | 1425

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* DELIVERED TO EIT LAB

Relinquished by (Sig.) ③ Date/Time

Received by (Sig.) ④ Shipper Name & # Date/Time

Relinquished by (Sig.) ⑤ Date/Time

Received by (Sig.) ⑥ Shipper Name & # Date/Time

Temperature of blank or representative sample
At time of collection 2.7 °C
At time of lab receipt 1.4 °C

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT
LABORATORY SERVICES
P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

AN EMPLOYEE-OWNED COMPANY

Laboratory Services Report

Client: Schlumberger Technology Corporation
Sangamo - Twelve Mile Creek Project
Attention Gary Odom by email

Date Received: 02/15/2011
Time Received: 12:15
Date Reported: 03/01/2011

South Carolina Laboratory Identification 23105
North Carolina Laboratory Certificate Number 27
NELAP Laboratory Identification E87822

Sample Number	*Sample Description*
AC95776	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/15/2011 at 08:45
AC95790	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/16/2011 at 08:54
AC96052	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/18/2011 at 08:50

The attached report is for the samples that were received and are referenced above. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements of the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty available upon request.

We appreciate the opportunity to be of service to you. Please contact us at (864) 232-1556 should you have any questions about this report.

Results released by: _____ ***Results reviewed by:*** _____
authorized signature

Carbon copy: Email to L Ketcham S Handley A Kohler S Cary

Case Narrative

AC95776 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/15/2011 at 08:45

Composite sample AC95776 was subcontracted to ETT for Acute and Chronic Toxicity tests.

AC95790 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/16/2011 at 08:54

This sample was an additional composite subcontracted to complete the Chronic Toxicity testing.

AC96052 Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/18/2011 at 08:50

This sample was an additional composite subcontracted to complete the Chronic Toxicity testing.

Sample Number	Sample Description, Date and Time Collected
AC95776	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/15/2011 at 08:45

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				03/01/2011 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 9 pages for Acute and Chronic Toxicity from ETT Environmental Inc.

Sample Number	Sample Description, Date and Time Collected
AC95790	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/16/2011 at 08:54

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				03/01/2011 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 9 pages for Acute and Chronic Toxicity from ETT Environmental Inc.

Sample Number	Sample Description, Date and Time Collected
AC96052	Schlumberger Technology TMC Water Treatment Plant Effluent Discharge composite, collected on 02/18/2011 at 08:50

Parameter	Result	Unit	Flag	RDL	Date/Time	Analyst	Method
Subcontracted Sample Analysis	Completed				03/01/2011 00:00		

Analysis comment for Subcontracted Sample Analysis: See enclosed subcontract report which includes a total of 9 pages for Acute and Chronic Toxicity from ETT Environmental Inc.

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

DMR Attachment for Pass/Fail Whole Effluent Toxicity Test Results

TWELVE MILE CREEK RESTORATION PROJE Permit number SC   Discharge number

FINAL LIMITS   04/01/2010-   Parameter TGA3B   MLOC=1 ATC=35.5% effluent

		Year	Month	Day		Year	Month	Day
Monitoring period	From	11	2	01	To	11	2	28

Mortality Data - Acute and Chronic Tests / Reproduction Data-Chronic Tests Only

Date 15-Feb-11
Lab ID 23104

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control	20	0				
Test	20	0	Pass			

Mortality Data - Acute and Chronic Tests / Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests / Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests / Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests / Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Mortality Data - Acute and Chronic Tests / Reproduction Data-Chronic Tests Only

Date
Lab ID

Group	# Adults	# Dead	Pass/Fail	Average	Variance	Pass/Fail
Control						
Test						

Signature of Principal Executive Officer or Authorized Agent ____________

Name/Title of Principal Executive Officer (*typed or printed*) ____________

DHEC 3420 (8/05)

Control Survival and Reproduction by Test Day

source	rep	1	2	3	4	5	6	7	8	Total	
S10 2-4	A		0							0	
AA1 2-4	A		0							0	
W9 2-4	A		0							0	
F5 2-3	A		0							0	
Random	A		0							0	
	B		0							0	
	B		0							0	
	B		0							0	
	B		0							0	
	B		0							0	
	C		0							0	
	C		0							0	
	C		0							0	
	C		0							0	
	C		0							0	
	D		0							0	
	D		0							0	
	D		0							0	
	D		0							0	Mean
	D		0							0	0.0

35.5 % Effluent Survival and Reproduction by Test Day

		1	2	3	4	5	6	7	8	Total	
S10 2-4	A		0							0	
AA1 2-4	A		0							0	
W9 2-4	A		0							0	
F5 2-3	A		0							0	
Random	A		0							0	
0	B		0							0	
0	B		0							0	
0	B		0							0	
0	B		0							0	
0	B		0							0	
0	C		0							0	
0	C		0							0	
0	C		0							0	
0	C		0							0	
0	C		0							0	
0	D		0							0	
0	D		0							0	
0	D		0							0	
0	D		0							0	Mean
0	D		0							0	0.0

										17-Feb-11	
										03:40 PM	AE
Old temp. °C			24.4								

D=Dead N/A-Lost or not used

****

03:40 PM

	T37273
	SCHLUMBERGER
	EFFLUENT
	SC
	0
	2
	15-Feb-11
	1445
	VC
	Ceriodaphnia dubia
	2-14-11
	BATCH 2
	SCAPF
	MHSF
	%
	35.5
	30 ml
	15 ml
	1
	16lt/8dk
	24.8
	0.05 ml
	0.05 ml
	EPA 821-R-02-013;1002

Comments
NEO. FED AT 1225

ETT environmental, inc.
P.O. Box 16414, Greenville, SC 29606
(864) 877-8942 • Fax (864) 877-8938
4 Craftsman Court, Greer, SC 29650

Ceriodaphnia dubia Survival and Reproduction Test

EPA-821-R-02-013 Method 1002

Test Species: *Ceriodaphnia dubia*

Client: SCHLUMBERGER
Facility: EFFLUENT
NPDES #: SC

Test Date: 15-Feb-11

Laboratory ID#: T37272

Test Reviewed and Approved By:

Robert W. Kelley, Ph.D.
Laboratory Manager

[redacted] **Certification #E87819**

Test results presented in this report conform to all requirements of NELAC, conducted under NELAC Certification Number E87819 Florida Dept. of Health. Included results pertain only to provided samples.

SCDHEC Certification #23104

NCDENR Certification # 022

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

DMR Attachment for Chronic Multi-Concentration Whole Effluent Toxicity Test Results Using Linear Interpolation

TWELVE MILE CREEK RESTORATION P Permit number SC Discharge number

FINAL LIMITS 04/01/2010- Parameter Code TCP3B MLOC=1 CTC= 17.40% effluent

		Year	Month	Day		Year	Month	Day
Monitoring period	From	11	2	1	To	11	2	28

Date 15-Feb-11

Lab ID 23104

IC25= 54.61%

48 hr Chronic LC50 = > 100.0%

	Mortality Data		Reproduction Data	
Group	# Adults	# Dead	Group Average	Group Variance
0	10	0	26.5	19.17
8	10	0	26.8	5.51
17.4	10	0	26.3	4.46
35	10	0	23.4	6.49
50	10	0	21.5	13.39
100	10	2	5.1	17.66

% Survival Effect at CTC= 0.0%

% Reproduction Effect at CTC= 1.3%

Date

Lab ID 23104

IC25=

48 hr Chronic LC50 =

	Mortality Data		Reproduction Data	
Group	# Adults	# Dead	Group Average	Group Variance

% Survival Effect at CTC=

% Reproduction Effect at CTC=

Signature of Principal Executive Officer or Authorized Agent _____

Name/Title of Principal Executive Officer (*typed or printed*) _____

DHEC 3710 (8/05)

CHRONIC DEFINITIVE SURVIVAL AND REPRODUCTION/GROWTH TEST
Statistical Analyses

Client: **TWELVE MILE CREEK RESTORATION PROJECT**

Sample Identification: **EFFLUENT**

Test Date: **15-Feb-2011**

Tests for Normality and Heterogeneity of Variance

Parameter	*Test Used*	*Result*
Normality	N/A	N/A
Variance	N/A	N/A

Sample Use

	Sample Date	Sample Used		
Sample A	15-Feb-11	15-Feb-11	16-Feb-11	
Sample B	17-Feb-11	17-Feb-11	18-Feb-11	
Sample C	19-Feb-11	19-Feb-11	20-Feb-11	21-Feb-11

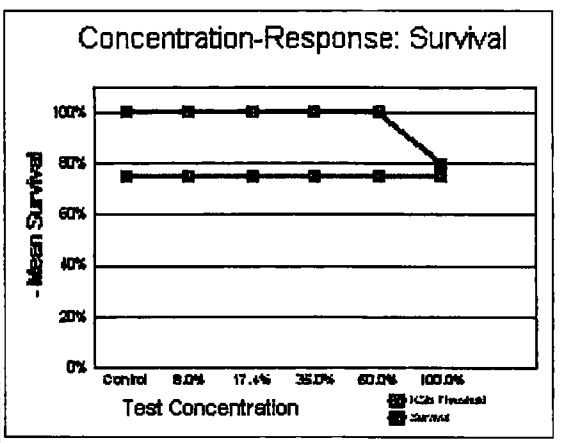
Tests for Differences in Survival and Reproduction

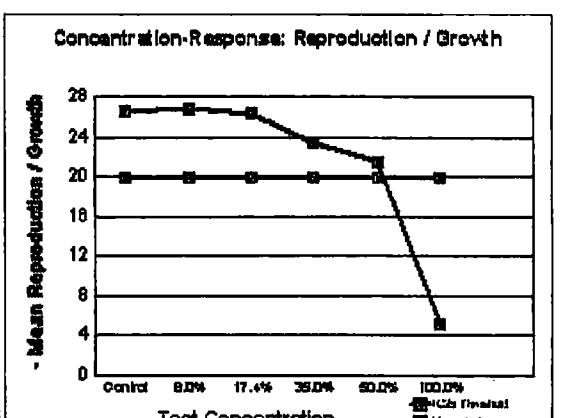
Test Type Used: **Linear Interpolation**

		% Effluent					
Effect	**Control**	8.0%	17.4%	35.0%	50.0%	100.0%	
Survival	100.0%	100.0%	100.0%	100.0%	100.0%	80.0%	
% reduction		0.0%	0.0%	0.0%	0.0%	20.0%	
Reproduction	26.5	26.8	26.3	23.4	21.5	5.1	
% reduction (smoothed)		0.0%	1.3%	12.2%	19.3%	80.9%	
Variance	19.17	5.51	4.46	6.49	13.39	17.66	

Acceptability Criteria	Value	Upper Limit	Lower Limit
CV:Coeff. of Variation	16.5%	42.0%	8.9%
PMSD: % MSD	12.0%	37.0%	11.0%
MSD:Min. Sign. Diff.	3.2	Acceptability criteria limits not exceeded	

IC25 Point Estimates		TEST RESULTS	
Survival	IC25= > 100.0%	%Reduction per Linear Interpolation	
Reproduction	IC25= 54.6%	@CTC of	17.4%
Hypothesis Testing		Survival effect	0.0%
NOEC Reproduct	50.0%	Reproduction effect	1.3%
ChV Reproducti	70.7%		PASS





Comments

source	rep	Test Day 1	2	3	4	5	6	7	8	Total	
CC3 2-4	A			0	3	7	0	11		21	control
T1 2-4	B			5	0	9	13			27	
AA5 2-4	C			0	5	11	0	18		34	
B7 2-3	D			0	5	6	0	13		24	
V7 2-4	E			4	0	10	13			27	
S9 2-4	F			0	5	8	0	16		29	
C8 2-3	G			0	6	8	0	13		27	
BB3 2-4	H			0	5	11	0	16		32	
F2 2-3	I			4	0	9	8			21	
W8 2-4	J			0	4	7	0	12		23	26.5
8	A			0	5	6	0	14		25	
	B			4	0	12	13			29	
	C			0	5	9	0	17		31	
	D			0	6	9	0	9		24	
	E			5	0	9	11			25	
	F			0	5	7	12			24	
	G			0	5	10	0	13		28	
	H			0	5	11	0	12		28	
	I			0	4	0	11	13		28	Mean
	J			0	5	10	0	11		26	26.8
17.4	A			0	3	12	0	13		28	
	B			4	0	8	11			23	
	C			0	6	8	0	11		25	
	D			0	6	10	0	13		29	
	E			4	0	9	13			26	
	F			0	6	7	0	13		26	
	G			0	4	10	0	13		27	
	H			0	3	8	0	12		23	
	I			3	0	11	14			28	Mean
	J			0	4	10	0	14		28	26.3
35	A			0	4	8	0	8		20	
	B			4	0	8	11			23	
	C			0	5	10	0	10		25	
	D			0	4	9	0	12		25	
	E			3	0	6	12			21	
	F			3	0	10	10			23	
	G			0	5	5	0	10		20	
	H			0	4	9	0	11		24	
	I			4	0	9	12			25	Mean
	J			0	5	11	0	12		28	23.4
50	A			0	3	6	0	6		15	
	B			4	0	5	12			21	
	C			0	3	9	0	9		21	
	D			0	4	7	0	12		23	
	E			3	0	9	13			25	
	F			0	3	4	0	11		18	
	G			0	5	6	0	12		23	
	H			0	4	8	6	9		27	
	I			2	0	10	12			24	Mean
	J			0	4	7	0	7		18	21.5
100	A			0	0	6	0	0		6	
	B			3	0	3	0	0		6	
	C			0	3	0	0	0		3	
	D			2	0	0	0	0		2	
	E			0	4	0	6	0		10	
	F			0	0	5	0	0		5	
	G			0	0	0	0	0		0	
	H			0	3	6	0	5		14	
	I			2	0	0	D			2	Mean
	J			0	3	0	0	D		3	5.1
renew		AE	BB	JS	AE	BB	AE			End Date	
fed		AE	BB	JS	AE	BB	AE			22-Feb-11	
time fed & renew		01:41 PM	01:52 PM	02:12 PM	08:21 AM	11:48 AM	02:07 PM			11:08 AM	JC
New temp. °C		25.4	24.5	25.4	24.7	25.2	25.2				
Old temp. °C		25.7	24.9	25.3	25.5	25.5	25.5	24.6			

D=Dead N/A-Lost or not used

Lab#	T37272
Client	SCHLUMBERGER
Sample ID	EFFLUENT
NPDES#	SC
County	0
Month	2
Start & fed Date	15-Feb-11
Start & fed Time	1340
Started & fed By	JC
Test Organism	Ceriodaphnia dubia
Neo. born date	07-Dec-99
Neo. born time	BATCH 2
Test Type	SCCD
Dilution Water	MHSF
Units for Conc.	%
%3rd BROOD	
Test vessels	30 ml
Test volume	15 ml
Incubator #	1
Light	16l/8dk
Initial Temp °C	25
Selenastrum	0.05 ml
YAT	0.05 ml
Test method	EPA 821-R-02-013:1002

Comments

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

Client Name: ROGERS & CALLCOTT

Address: ______

Report To: ______

Telephone No. ______ FAX No. ______

PO No. ______ Project No. JMC

Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	½G
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl₂ Check	
Lab Receipt pH Check	
Preserved (Code)	A

Preserved (Code): A–None, B–HNO_3, C–H_2SO_4, D–NaOH, E–HCL, F–$Na_2S_2O_3$, G–Boric Acid, H–Ascorbic Acid, I– ____

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: Acute + Chronic Toxicity	COMMENTS: 37272A/37273
AC 95776	2-15	8:45	WATER TREATMENT PLANT* ET. DISCH.	1	1	SAMPLER: SET ON @ 8:45 ON 2/14/11, TIME SUP. BY R+C

SAMPLER Relinquished by (Sig.) ①	Date/Time	Received by (Sig.) ② Shipper Name & #	Date/Time	KNOWN HAZARDS ASSOCIATED WITH SAMPLES
[signature]	2-15-11 1215	[signature]	2-15-11 1215	* DELIVERED TO ET LAB
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time	
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time	Temperature of blank or representative sample — At time of collection ____ °C; At time of lab receipt 2.5 °C

Seal # ____ at'chd by ○ Recvd. Intact by ○ Seal # ____ at'chd by ○ Recvd. Intact by ○

Form Revised July 2008 R/C COC FORM

ROGERS & CALLCOTT LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

PAGE 1 of 1

Client Name ROGERS & CALLCOTT

Address

Report To:

Telephone No. FAX No.

PO No. Project No. TMC

Rogers & Callcott Lab No.	Yr.11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: Chronic Toxicity	Filtered (Yes/No)	Cooled (Yes/No)	Container Type (P/G)	Container Volume	Sample Type (Grab/Composite)	Sample Source (WW, GW, DW, Other)	Sample Source Chlorinated (Yes/No)	Lab Receipt Cl2 Check	Lab Receipt pH Check	Preserved (Code) A-None B-HNO_3 C-H_2SO_4 D-NaOH E-HCL F-$Na_2S_2O_3$ G-Boric Acid H-Ascorbic Acid I-	COMMENTS:
						N	Y	P	½G	C	WW	N	I	I	A	37272B
AC 95790	2/16	0854	WWTP INFLUENT *													SAMPLER SET-UP @ 0854
			EFF. DISCH													TIME MOD. BY N 2/15/11
																BY RTC

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time	KNOWN HAZARDS ASSOCIATED WITH SAMPLES
①	2/16/11 1422	② Shipper Name & #	2/16/11 1422	* DELIVERED TO ETT LAB
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time	
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time	Temperature of blank or representative sample: At time of collection 3.0 °C; At time of lab receipt 2.6 °C

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

Form Revised July 2008

R/C COC FORM

ROGERS & CALLCOTT
LABORATORY SERVICES
P.O. Box 5655, Greenville, SC 29606
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Shipping Address: 426 Fairforest Way
Greenville, SC 29607

CHAIN OF CUSTODY RECORD

PAGE 1 of 1

Client Name: Rogers + Callcott

Address:

Report To:

Telephone No.: FAX No.:

PO No.: Project No.: TMC

Rogers & Callcott Lab No.	Yr. 11 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: Chronic Toxicity
AC 96052	2/10	0850	WARM TREATMENT PLANT EFF. Disch. *	1	1

Filtered (Yes/No)	N
Cooled (Yes/No)	Y
Container Type (P/G)	P
Container Volume	½G
Sample Type (Grab/Composite)	C
Sample Source (WW, GW, DW, Other)	WW
Sample Source Chlorinated (Yes/No)	N
Lab Receipt Cl2 Check	
Lab Receipt pH Check	
Preserved (Code)	A

A-None B-HNO_3 C-H_2SO_4 D-NaOH E-HCL F-$Na_2S_2O_3$ G-Boric Acid H-Ascorbic Acid I-____

COMMENTS:

37272C

Sample set out @ 0850 on 2/7/11. Time prop. By R+C

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time
①	2/10/11 1330	② Shipper Name & #	2/10/11 1330
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

* DELIVERED TO ETT LAB

Temperature of blank or representative sample

At time of collection 3.1 °C

At time of lab receipt 2.8 °C

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

Form Revised July 2008

R/C COC FORM

ARCADIS

Attachment 3

March Monthly Construction Photo Log

Demolition of Woodside I Dam nearing completion.

Remaining WSI dam concrete removed to bedrock.

Crane pad construction continues at WSII dam.

Disassembly of the penstock at WSII dam.

Dredge Clare (South Bank) and Dredge Kami (North Bank) continue to operate upstream of WSII.

Deconstructing access road and grading area next to location of former WSI dam.